

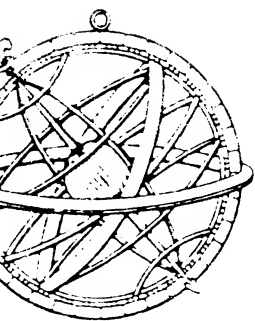
AstroStarTM I

**Astrological Computer Programs
for the TRS80 Models I and III
and CP/M microcomputers**

by Douglas Kellogg

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**Astro-Graphic Services, Inc. / AGS Software
P.O. Box 28, Orleans, Massachusetts 02653
617 255-0510**



ASTRO-GRAPHICS SERVICES, Inc.

AGS SOFTWARE

A.H. Blackwell Steve Blake Gary Christen Rob Hand Pat White

REVISIONS AND ADDITIONS TO ASTROSTAR I DOCUMENTATION - 12/15/1982
CP/M VERSION

Since the introduction of the Revised AstroStar I Documentation (released 10/1/1982), some unclear areas in the general instructions have been noted. Some design flaws have also been brought to our attention. This preliminary notice should serve to clear up some of the difficulties that users of the AstroStar program (CP/M version) have encountered.

There are three specific areas that some users are reporting difficulty with. They have to do with Installation, File Handling and Dictionary Changes.

INSTALLATION

The INSTALL program was discussed in an additional sheet inserted into the Revised Documentation. That sheet explained how to manipulate this program and install AstroStar onto your particular CP/M system. INSTALL gives you the option of customizing the program to your CRT, printer configuration, choice of planetary output (specifically the Transneptunian Planets of the Uranian System) and some future options planned for the AstroStar series. Regretably, this sheet did not fully explain how to actually save an installed AstroStar or which screen option to select for the Osborne I computer.

SAVING AN INSTALLED ASTROSTAR

In order to save an installed AstroStar, follow the instructions on the INSTALL sheet. When you have reached the last item and answered it, you will be returned to the main menu of the AstroStar program. At this point type

^C

(^C means Control-C, to type it, first hold the Control key down, then press C on the keyboard. Release C first and then release the Control Key). A ^C will break the program and reinitialize the system and disk. It is referred to as a "warm boot" and should be used every time a disk change is made. At this point, the newly installed AstroStar is still residing in the RAM memory of your computer and the system has been restarted. You should see

A>

on your screen. To save your newly installed AstroStar to disk, type

SAVE 112 RUN.COM<CR>

(<CR> means hit the button marked RETURN or ENTER and stands for carriage return). This will cause the computer to write any material in the memory to the disk under the specified name RUN.COM (for the technically oriented this command means "save 112 pages of 256 bytes each from the beginning of the main memory to the logged-on disk drive using the file name RUN.COM and write over any file with that name if any file with that name already exists"). Following the above instructions will enable you to save any modifications in the AstroStar program.

OSBORNE PARTICULARS

Some particular problems using the INSTALL program exist with the Osborne I computer and possibly other computers that utilize a "Set-Up" routine and odd screen formats.

OSBORNE SCREEN FORMAT

When running INSTALL, you will be prompted for the screen size of your terminal. The Osborne I's screen size is choice 3, it has an 80-column x 24-line terminal. With the AstroStar program, you must utilize the unique scrolling features of the Osborne screen in order to read some of your prompts. With practice, screen manipulation will be a snap.

PRINTER SITUATIONS

Many Osborne owners are using a printer that is addressed via the parallel output port of their computer. The Osborne, when shipped from the factory, is "set-up" to run a printer via the serial output port. This means that if you hook-up your printer to the Osborne through the parallel port and run any printer oriented software, the printer will "hang-up" and the system will stop dead in its tracks. Most Osborne dealers realize this and "set-up" the Wordstar diskette to print through the parallel output port. They usually don't inform the customer that they have done this and neglect to change the "system" on the master CP/M disk to conform to the parallel port. Consequently, when the user attempts to use AstroStar and print out the results, the computer and printer "hang-up" and the user is found punching the reset button and getting on the telephone to AGS complaining of defective software. There are two ways to remedy this problem. One is to become completely familiar with CP/M and all the ins and outs of the Osborne. This is the hard way. The easier way is to follow the procedure outlined below.

WORDSTAR PRINTS AND ASTROSTAR DOESN'T

Assuming that your WORDSTAR program produces printed output, we can use the CP/M "system" that resides on your WORDSTAR disk (use your back-up) for this operation. Place your working WORDSTAR disk in drive A and boot-up your system. Put your CP/M system disk in drive B and log onto drive B by typing

B:<CR>

and seeing on your screen

B>

At this point, type

SYSGEN<CR>

and answer

A

when the first prompt (SOURCE DRIVE:) appears and follow the instruction to type

<CR>

when prompted. Type

B

when the next prompt (DESTINATION DRIVE:) appears and follow the instruction to type

<CR>

when prompted. When you are prompted again (DESTINATION DRIVE:) stop and remove your CP/M system disk from drive B and insert your AstroStar disk into drive B. Type

B

and follow the instruction to type

<CR>

when prompted. When you are prompted again (DESTINATION DRIVE:), remove your WORDSTAR disk from drive A and your AstroStar disk from drive B. Insert your AstroStar disk into drive A and type

<CR>.

This will re-boot the "system" and you can proceed to run the AstroStar program knowing your printer will work with this software.

There is one small item to note when using the above procedure. The SET-UP program of the Osborne computer allows the user to reassign some of the keys on the keyboard to serve other functions. Sometimes when the WORDSTAR disk is "set-up", dealers will change the function of some of the arrow keys to be in conformity with the rest of the WORDSTAR program. You shouldn't have any difficulty with this practice, unless you are running other software that makes use of these keys. AstroStar doesn't use these keys. You may find, after you are more familiar with the "set-up" procedures of the Osborne computer, that you may want to change some keys to assist the operation of your own AstroStar program. You can be very creative and can personalize your program with these options. We suggest that you get your AstroStar running to your satisfaction, become comfortable with its operation and then study the SET-UP program supplied with your Osborne to modify your keyboard.

WORDSTAR DOESN'T PRINT AND NEITHER DOES ASTROSTAR

If your WORDSTAR disk doesn't drive your printer, then you will have to utilize the SET-UP program supplied with your Osborne disks. The use of the SET-UP program is well documented in the Osborne instruction book and those procedures should be followed. Remember to use the SYSGEN program to write a new "system" onto your AstroStar disk.

FILE HANDLING

The file handling ability of AstroStar is very flexible. It follows CP/M's standard protocol for the manipulation of file names and has an internal file structure that transcends the file limits of CP/M. What seems to be unclear to some users is the initialization procedure for setting up a personal file management system. The AstroStar documentation gives an outline of the method and is correct. Here, we will supply more detailed information to reduce some confusion.

CP/M FILENAMES

All CP/M file names are limited to eight characters. These characters can be letters or numbers. CP/M filenames cannot have a number in the first character position of the name. You can also append an extension to a CP/M filename of up to three letters if you separate the filename and the extension with a period. Some examples of legal and illegal filenames:

<u>LEGAL</u>	<u>ILLEGAL</u>	<u>COMMENTS on ERRORS</u>
ASTAR1.CHT	1ASTAR.CHT	Filename begins with number.
CLIENTS.CHT	CLIENTS.1	A number in the extension.
FAMILY	FAMILY&FRIENDS	Filename is too long.
C1 5/82.FEM	1 5/82C.FEM	Filename begins with number.

ASTROSTAR CHARTNAMES

The AstroStar file system uses any selected CP/M file name. This CP/M filename is the title of a user selected group of individual filenames that represent the individual charts to be saved. These individual chartnames follow a different structure than standard CP/M filenames. They can be up to 22 characters in length and have no extensions. You can only access the individual chartnames after invoking the CP/M filename that they are listed under. The CP/M filenames can be manipulated using various CP/M utilities such as DIR, PIP, STAT, ETC. (see your CP/M guide for information on the operation of these utilities).

NEW CP/M FILENAME INITIALIZE

When you are creating a new file for use with the AstroStar program, you must **INITIALIZE** the CP/M filename. To initialize a new CP/M filename, type

RUN<CR>

and select output in order to get to the main menu. When the main menu appears, type

11<CR>

for **CHANGE FILE NAME** and at the prompt, type

FILENAME.EXT<CR> (any valid CP/M name of your own choosing)

you will be returned to the main menu and when it appears, type

10<CR>

for **INITIALIZE FILE**. The first prompt will ask **ARE YOU SURE (1=YES)?**, you should type

1<CR>.

The next prompt will ask **WHICH DRIVE (A,B,C,D)?**, you should respond with the letter of the disk drive that you want to store your data on followed by a

<CR>

The last prompt asks for the **MAXIMUM NUMBER OF ENTRIES?** and you should respond with a number representing the total amount of AstroStar filenames you want stored under the filename you are initializing followed by a

<CR> (here you are limited only by the total amount of free space on the diskette that you want to store the data on).

FILING SUGGESTIONS

It is suggested that you make your AstroStar disk into a master disk using the **SYSGEN** program and always have it reside in drive A. For keeping files, use drive B. The functions of the AstroStar program seem to work quite reliably when they are reading a disk file input instead of a manual keyboard entry or reading its own memory. We suggest creating chartfiles for any information that is to be processed with any AstroStar module.

REENTRY

Once you have **INITIALIZED** a file, you can always reenter that file name in one of two ways. You can call the filename when you load the program or you can call the filename from the main menu using option 11 (**CHANGE FILE NAME**). For example, let's suppose we have a CP/M file called **CLIENTS.CHT** on drive B and your AstroStar program is on drive A. At the

A>

you would type

RUN B:CLIENTS.CHT<CR>

and the program would load and log-on the filename **CLIENTS.CHT** from drive B and you can proceed. Or you can type

RUN<CR>

select for output in order to get the main menu and type

11<CR>

for CHANGE FILE NAME and at the prompt, type

B:CLIENTS.CH1<CR>

you will be returned to the main menu. You may proceed to calculate charts or manipulate the file as you wish.

DICTIONARY CHANGES

A known bug in the AstroStar program concerns dictionary changes. The ability to change orbs is a very desirable feature in any software. The known bug does not affect the ability to change orbs. It limits the user to changing the orbs individually, one at a time. If you attempt to use the command CHANGE ALL ORBS, the software will bomb (this is true on the Osborne). Therefore, to ease around this bug (until this and other design features are revamped), change orbs, one at a time, using the DICTIONARY CHANGES option. To save your changes, exit back to the main menu, type

^C

and when the

A>

appears, type

SAVE 112 RUN.COM<CR>

This procedure is fully discussed in the INSTALL section under the paragraph titled Saving Install.

FINDING BUGS AND UNDESIRABLE DESIGN FEATURES

We are trying to make AstroStar the finest program of its kind. We will welcome any comments or suggestions you (as the user) can offer us. Please write to us about any bugs you come across or suggest to us design changes that you would like to see implimented. We want to keep our lines of software growing and evolving and we need to know what you need from our products. Please send all ideas and comments to:

Gary Christen
AGS Software
BOX 28
Orleans, MA
02653

Dedicated to Bruce Hunter

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USING INSTALL

These instructions are for setting-up your AstroStar program for CP/M computers. Before doing anything else to your disk, MAKE A BACK-UP COPY AND PLACE YOUR MASTER COPY IN A SAFE PLACE!!!

You may install AstroStar for various terminal, printer and astrological options by using the INSTALL overlay (INSTALL.OVR). First, place your back-up disk (with a system on it) in drive A of your computer and type RUN<CR> (<CR> means carriage return). Answer with a 1 to the first question and the Main Menu will appear. The INSTALL module is called up by using the RUN ASTROSTAR PROGRAM (choice 15) from the Main Menu. You answer the question NAME OF FILE TO RUN with INSTALL, and that module is loaded. For all questions which can be answered with a yes or a no, 0 represents NO and 1 stands for YES, as in all of AstroStar.

The first question — Does the printer require line feeds with carriage returns — is concerned with whether you have an auto-line feed printer. Many printers have an internal switch which controls whether a line feed is automatically generated whenever a carriage return is received from the computer. Some programs expect this to happen, while others don't. Some need both a carriage return and a line feed. If your printer and computer program don't agree you will either get all lines on top of one another or double-spaced lines. The best way of telling which you need is to try both options with INSTALL and see which is correct.

The next question asks if this is to be an Uranian version. If you answer "Yes", the question "Do you want hypothetical planets" will appear whenever the list of planets are calculated. If you answer this question with a "1" the positions of the eight transneptunian planets used in Uranian astrology will be calculated. For this reason the question appears when reading in a chart from the files asking if you wish to use all planets stored; you can store 21 points but use only 13 in your analysis of the chart. When calculating angles on a 21-position chart, if you try to print the chart from memory you will find that it has been clobbered — a piece of computer jargon whose meaning is obvious — so that you will have to read the chart in again from the file.

The third question asks if you are using a graphics printer. At present this means an Epson with Graphtrax. If you answer this question with a "1", you are given the option of using graphics or not at various points in the program.

The next question asks if your printer will respond to form feeds (ASCII 12). Most printers will, so that this question can be answered with just a carriage return. For those printers which won't, and single-sheet printers, answer the question with a "1"; the printer will pause every time a form feed is expected; do what you need to do manually and hit <RETURN> to continue the program. Form feeds are generated by option 13 from the Main Menu, at the beginning of a full-page chart print-out, and after printing a chart from the file.

The fifth question concerns your terminal screen size. Most CP/M terminals are 80x24, so answer "3". Choice 1 is for an Apple without an 80-column board; choice 2 is for the few 64x16 terminals around. AstroStar was developed on such a terminal, and it remembers its humble beginnings.

The sixth question is concerned with the width of your printer; if you don't have a printer, ignore this question with a return. Most printers use 80 columns, which is choice 1. If you are using a wider carriage or smaller characters on your printer, choose 2 or 3. This choice will only make a difference when you choose the output on printer at the beginning of the program. Output to both will give the same width of printer output as terminal output.

The last two questions concerning the asteroids and Chiron are in for further expansion. The program ignores the answers to these questions. Don't get your hopes up.

At this point, the program will automatically exit back to the Main Menu. When it appears, type a **CONTROL-C** (to do this, hold down the Control key and then type a letter C, then release the Control key). DO NOT USE OPTION 9 FROM THE MAIN MENU TO DO THIS OPERATION!

When the operating system signs on (you'll see A> on your screen), type **SAVE 112** and **QUIT<CR>**.

QUICK GUIDE TO ASTROSTAR

1. Insert AstroStar disk.
2. Type 'RUN'.
3. Answer output device question.
4. Make choice from menu.
5. Initialize file if you haven't done so.

DATE: day.month.year

TIME: hours.minutes

AM/PM: AM/A/0 (default) or PM/P/1

TIME ZONE: any of the abbreviations given or hours to add to
convert local time to GMT. Default is GMT

LATITUDE: degrees.minutes (South is negative)

LONGITUDE: degrees.minutes (East is negative)

NOTE: use option #9 on main menu to close initialized files.

To print charts from files on drive B, type after A] RUN B:ASTRO

To get default choice, just push carriage return key.

For CP/M, control-S stops and starts the display scrolling,
control-C returns to the operating system, control-P toggles
the printer on and off (so you can get a dump of the screen)
and control-N [RETURN] returns you to the main menu.

INTRODUCTION

It isn't very likely that a manual for a sophisticated computer program will suit everybody--no matter how the manual is written it will be too technical for some and too simple for others. If you have limited experience with computers, read the following section on backup procedures first (this is very important), and then the section on using prompts (in chapter 2), and then try doing the sample chart. If you just need a brief reminder of what to do, see the Quick Guide To AstroStar. Please note that the section on answering prompts is important for everyone.

AstroStar is written so that, except for some of the more complicated procedures, it can be run without the manual. An excellent way to thoroughly learn AstroStar is to play with the program. Try something and see what happens. Make mistakes on purpose, then examine the results. If something unexpected occurs, try to recreate it. While we have tried to produce an error-free program, it is close to impossible with one of this complexity. Should you find errors in the program, please let the publisher know.

First the backup procedures will be described. Whenever you receive a new program, make a working copy for use while keeping the original safe. Accidents happen and it would be a big loss to ruin the only copy of an expensive program. After Backup Procedures there are some general remarks about menu-driven programs and how to answer the prompts, or questions, AstroStar asks. Next is a sample to "run" where Ronald Reagan's chart is calculated. The next section is a detailed description of all the sections of AstroStar. Finally, there is a technical section which includes a BASIC program allowing access to AstroStar files.

CHAPTER TWO -- USING MENUS AND ANSWERING PROMPTS

AstroStar is all menu-driven. What this means is that you are given a list of choices and are asked to select one. For example, you will be asked:

- 1) CALCULATE A CHART
- 2) ANALYZE A CHART
- 3) CALCULATE A RETURN?

The question mark at the end of the last possible selection is a signal that the computer is waiting for your answer. Respond with a number '1', '2' or '3', depending on which of these three options you want, then press the [ENTER] or [RETURN] key. If you don't depress [ENTER] after making your selection, the computer will not get your response. If you answer with a number not within the range given (1 to 3 in this case) then the menu--list of options--will be displayed again. In many cases after choosing a selection another menu, or a sub-menu, will be displayed. For example, in the above, after choosing 2 the screen will display:

- 1) CALCULATE ASPECTS
- 2) CALCULATE MIDPOINTS
- 3) HARMONIC SORT?

then choose one of these three options to continue.

Whenever the program needs information or input, it will ask a question, a prompt, and display a question mark. The computer will wait for your response. The prompt usually indicates the way to type your response. For example, when asked for an angle, the question will be followed by DDD.MM indicating to enter (type in) up to three digits for the degrees, followed by a period, then two digits for the minutes. Note that 186.5 is understood as 186:05 and not 186:50. If you don't input two numbers separated by a period, what you don't enter will be assumed to be zero--thus 145 is 145:00. The separator doesn't have to be a decimal (a period); it can be anything other than a number or space--thus 45:17, 13N12 and 12/24/1979 are all valid. For the questions AM or PM and TIMEZONE? a response with lower case letters will be ignored giving the defaults of AM or GMT. Many times a question will be asked, e.g. DO YOU WANT TO SAVE THIS CHART, which can be answered yes or no. In all these cases, 0 is no and 1 equals yes; this makes it easy to answer using just the numeric keypad. Also, hitting just the [ENTER] key will produce a '0', so that to answer no, you may push [ENTER] only.

In certain cases values are assumed if you input nothing and just hit the [ENTER] key. These assumed values are called defaults. As indicated above, '0' is the normal default value. For the question AM or PM, the default value is AM so that if you use a 24-hour clock you don't need to answer the question except for times between noon and 1 pm. For the time zone choice, the default is GMT, the first of the list of time zones. Thus an input of 1,12,1947 [ENTER] 14 [ENTER] [ENTER] [ENTER] will do a chart for January 12, 1947 2 PM GMT.

A question will be repeated if the input doesn't conform to the correct format. For example, 13:06:2007 is an incorrect date because there is no 13th month, and 17:75 is incorrect for a time since there are only 60 minutes to an hour.

CHAPTER ONE --- BACKUP PROCEDURES

Upon receiving AstroStar the first thing to do is to copy the disk. This is extremely important. Do not use the original disk without first having made a copy--and then it is best to use only the copy. Keep the original disk unused and in a safe place.

While AstroStar operates quite well with just one drive, two drives are required for copying the program to a TRSDOS system disk. Unfortunately, we are prohibited from supplying AstroStar on a system disk. If you have only one drive, and neither your friends or the local Radio Shack store have a two drive system, send your AstroStar disk and your operating system disk to your AstroStar dealer. A combined disk will be returned to you (be sure to include your street address for UPS delivery). If you have two drives, insert the program disk in Drive 1 and a system disk in Drive 0. Using the COPY command as described in your computer's disk operating system manual, copy RUN/CMD and all the files ending with "/OVR" onto the system disk. Here are some sample commands:

```
COPY RUN/CMD:1 TO RUN/CMD:0
COPY EPHEM/OVR:1 TO EPHEM/OVR:0
COPY ANALYSIS/OVR:1 TO ANALYSIS/OVR:0
COPY RETURN/OVR:1 TO RETURN/OVR:0
```

If you are using the CP/M version of AstroStar, use the PIP command instead of COPY. For example, PIP A:=B:RUN.COM copies RUN from drive B to drive A.

Once you have a combined system disk with AstroStar, make a backup copy of it. To do this use the TRSDOS command BACKUP. Insert a system disk which has the file BACKUP/CMD. This could be the disk which came with the disk drive. Type BACKUP. When the light goes out on the drive 0, remove the diskette, insert the AstroStar system diskette in 0 and a new diskette in drive 1. Answering the prompts, the source drive is 0 (zero, not the letter "O") and the destination drive is 1. The program will copy the AstroStar system disk to drive 1. With CP/M, use the FORMAT command and then PIP B:=A:*. * to backup drive A onto drive B. If you wish you can store charts on disks separately from the actual program by using the data disk in drive 1 for your charts and AstroStar in drive 0. To prepare this use the TRSDOS program FORMAT which will prepare a disk in drive 1. This program asks you for passwords and names. You can answer with anything, but remember what you used.

When you are asked to input the position of a series of planets, use the format DD.SS.MM (for degree, sign, minutes). For example, 7.1.45 is seven degrees of the first sign, which is Aries, and 45 minutes. And 12.10.3 would be 12° Capricorn 03'. If the degrees, sign number or minutes is out of range, you will be asked to input the information again. In situations like this, where you are inputting a series of planetary positions, if you find you have made an error, input a negative number and the previous planet will be displayed again giving another chance to type in the correct position.

CHAPTER THREE --- SAMPLE

Here is a sample to "run-through" to get a feel for the program and an understanding of the output. Try it on your computer. For data we will use Ronald Reagan, February 6, 1911, 1:56 AM CST, Tampico, Illinois (41N38, 89W48). (This time is in dispute.)

First we put our AstroStar system disk, which we made using the COPY program as outlined above, in drive 0 (called drive A in CP/M terminology) and "boot" the system by pushing the reset button (see Figure 1 for sample terminal output). After we see DOS READY (CP/M displays an A followed by the "greater than" symbol, referred to as the 'A' prompt, which is illustrated as A] in this manual) we type RUN to begin AstroStar.

A]RUN

COPYRIGHT (C) 1982 DOUG KELLOGG. ALL RIGHTS RESERVED
OUTPUT ON: 1) TERMINAL 2) PRINTER 3) BOTH ? 1
(Responses are indicated with an underline.)

Figure 1 -- After "RUNning" AstroStar

Once the program has loaded and the copyright notice has appeared, the prompt OUTPUT ON: 1) TERMINAL 2) PRINTER 3) BOTH? appears. Output on the terminal is formatted slightly differently than output on the printer, due to different line widths. We answer '1' and the Main Menu appears (see Figure 2 for Main Menu and other chart calculation dialogue). We choose 1 to calculate a chart (push 1 [ENTER]); the disk drive whirs as the chart calculation module, EPHEM/OVR, is read into the computer's memory. We answer the prompt 1) TROPICAL (DEFAULT) OR 2) SIDEREAL ZODIAC with either '1' ENTER or just [ENTER] which gives the default value of the tropical zodiac. The next question is CHART FROM 1) INPUT DATA (DEFAULT) OR 2) FILE. This allows us to redo a chart from data stored in the disk file, but in this case we want to enter data from the keyboard so just hit [ENTER] for the default value. We are then asked for DATE:MM.DD.YYYY and we reply '2.6.1911'. (Remember to follow your response by pushing the [ENTER] key.) Next is TIME-HH.MM; we answer '1.56'. The next question is AM (DEFAULT) OR PM. We can answer with just an [ENTER] (to get the default value) or a '0' or an 'A' or 'AM'--all give the same result. Be sure to use upper case letters. To the time zone prompt we answer either 'CST' or just 'CS' (in upper case) as only the first two letters are significant--or 6, for the six hours to add to CST to convert to GMT. For the latitude question, answer '41.38', and for longitude we respond '89.48'. Now the question DO YOU WANT TO CHANGE ANY DATA? appears which gives us a chance to review our answers. If everything is correct we push [ENTER]; if there is an error, input a '1' and the birth data will be asked for again. With a CP/M system, we have a chance to change any of the items individually. The final question is NAME and we type 'RONALD REAGAN'. The name and birth data appear (with GMT) and shortly the planetary positions come up. The Appendix shows samples of output which is explained in chapters four through eleven. We are then given the choice of which coordinate system to use, which in most cases will be the "normal" geocentric coordinates, so we just hit [ENTER] again to select the default option. Next we are asked if we wish to view the sorted positions of the planets. This would allow us to very easily see the angular

relationships between the planets in different coordinate systems, as well as parallels and contraparallels in the vertical coordinates, but in this sample we will forgo this option and hit [ENTER] again. The modes and elements are displayed next. To continue the display, hit [ENTER] as directed. After this the angles of the chart (Ascendant, Midheaven, Vertex, East Point) and then the House Menu will appear. Let's use the Placidus house system and choose 7. The planets are listed in their houses, with those in the first quadrant (houses 1 through 3) in a first column, those in the second quadrant in a second column, and so forth. The prompt ANOTHER HOUSE SYSTEM (0=NO) comes up and we'll answer '1' to look at another system. When the House Menu appears again, we input '3' and the planets in the Koch houses are displayed. Wishing to go on, we hit [ENTER] and answer the next question--DO YOU WANT TO SAVE THIS CHART? Since we haven't previously initialized a file to save charts, we cannot save this one, so answer '0' or just [ENTER] (which are the same as far as the computer is concerned). The next prompt is ANOTHER CHART (0=NO), but we will now go on to analyze the chart, so we just hit [ENTER] and the main menu appears again. We choose '2', the disk drive whirs, and we see:

- 1) USE CHART JUST CALCULATED
- 2) INPUT CHART FROM KEYBOARD
- 3) INPUT CHART FROM DISK?

These choices allow us to analyze a chart just computed, or one we input a position at a time (great for working on charts published with no birth data), or one we have stored on the disk previously. In this case we choose '1' to analyze Reagan's chart. The next question is 1) HORIZONTAL (DEFAULT) OR 2) VERTICAL COORDINATES which we answer with just an [ENTER]. We next see the Analysis Menu (Figure 3). Let's look at the aspects in his chart--option 3. The Aspect Menu is displayed and we select '1' to see all angles between points for Sun through Pluto, Node, Ascendant and Midheaven. Since all these angles can't appear at once on the screen, the display is filled and we must hit [ENTER] as the prompt requests to see the rest. With CP/M, we can hold down the CONTROL key and S at any time to stop the display. CONTROL-S restarts it. Hitting [ENTER] a second time brings us back to the Aspect Menu where we choose '5'--SORT ANGLES--which sorts the angles computed with option 1 in ascending order; thus we can easily see that the aspect between JUpiter and URanus is 72:46--a quintile. When we are back to the Aspect Menu we choose '2' to find each planet in aspect to another (according to the Aspect Dictionary, but more about this later) and the orb of inexactitude.

Once we are back to the Aspect Menu, we choose 9) OTHER FUNCTIONS to return to the Analysis Menu, 6) OTHER FUNCTIONS to return to the Main Menu and finally to exit the program we use 9) RETURN TO DOS. In CP/M, use CONTROL-N [RETURN] to return to the Main Menu at any time.

To become familiar with the program and all the things it can do, just play with it awhile. Use charts previously calculated to compare results. (You may find some of your hand-calculated charts are incorrect.) Try all the options. If you don't understand something, think about it. If all else fails, read the manual. Experiment--you can't hurt the machine. Be sure you have a backup. If you can't save a chart, chances are you didn't initialize the file (Main Menu option 10). If you find yourself somewhere you don't want to be, or can't figure out how to get from here to there, you can always press the Reset button and type 'RUN' to start over, or use CONTROL-C under CP/M to return to the prompt 'A]', or use CONTROL-N.

- 1) CALCULATE A CHART
- 2) ANALYZE A CHART
- 3) CALCULATE RETURNS
- 4) CALCULATE PROGRESSIONS, DIRECTIONS
- 5) COMPARE TWO CHARTS
- 6) MANIPULATE THE FILE
- 7) PRINT A CHART
- 8) CHANGE OUTPUT
- 9) RETURN TO DOS
- 10) INITIALIZE FILE
- 11) RUN OWN PROGRAM
- ? 1

CP/M VERSION

- 1 - 10 SAME AS ABOVE
- 11) CHANGE FILE NAME
- 12) LINEFEED
- 13) FORMFEED
- 14) STORE CHART
- 15) RUN ASTROSTAR PROGRAM

1) TROPICAL (DEFAULT) OR 2) SIDEREAL ZODIAC? (Just hit ENTER
 DATE:MM.DD.YYYY? 2.6.1911 for tropical.)
 TIME:HH.MM? 1.56
 AM (DEFAULT) OR PM? [ENTER] gives the default AM.
 TIME ZONE:GMT, LMT, PST, MST, CST, EST, PDT, MDT, CDT, EDT?
CST
 LATITUDE:DD.MM (-INDICATES SOUTH)? 41.38
 LONGITUDE:DDD.MM (-INDICATES EAST)? 89.47
 DO YOU WANT TO CHANGE ANY DATA?
 NAME? RONALD REAGAN

Figure 2 -- Calculating a chart, including Main Menu

ANOTHER HOUSE SYSTEM (0=NO) ?
DO YOU WANT TO SAVE THIS CHART (0=NO) ?
ANOTHER CHART (0=NO) ?

? 2

1) USE CHART JUST CALCULATED
2) INPUT CHART FROM KEYBOARD
3) INPUT CHART FROM DISK? 1
1) HORIZONTAL(DEFAULT) OR 2) VERTICAL COORDINATES
?

1) DISPLAY PLANETS
2) DICTIONARY CHANGES
3) ASPECTS
4) MIDPOINTS AND HARMONICS
5) ANOTHER CHART
6) OTHER FUNCTIONS? 3

ASPECT CALCULATIONS POSSIBLE:

1) LIST ALL ANGLES
2) LIST ALL ASPECTS
3) SORTS ASPECTS BY RELATIVE ORB
4) SORT ASPECTS BY ABSOLUTE ORB
5) SORT ANGLES
6) LIST ANGLES TO A POINT
7) LIST ASPECTS TO A POINT
8) LIST ASPECTS TO MIDPOINTS
9) OTHER FUNCTIONS

? 1

Figure 3 -- Analyzing a chart, Analysis and Aspect Menus

CHAPTER FOUR --- CALCULATE A CHART

In order to construct a natal chart, or any other chart for which you have the date, time and location, use the CALCULATE A CHART menu selection. You will first be asked if you want to use the tropical or sidereal zodiac; the sidereal uses an ayanamsha of 23:20:38.15^{at epoch 1900.0} as determined by Cyril Fagan. If you input anything other than a '2' in answer to this question you will get the default tropical zodiac. The next question asks if you want to input natal data from the keyboard or to recalculate a chart from data already stored on the disk. This second option is very useful, for example, if you want to store the equatorial coordinates--right ascension and declination--of a chart whose geocentric coordinates have already been calculated. In most cases you will be entering the data, so just hit the [ENTER] key, and answer the questions of date, time, latitude and longitude. In reply to the AM/PM question, 'AM', 'A', '0' or [ENTER] will all give the same result; likewise 'PM', 'P' or '1' will all indicate times after noon. This must be upper case letters. The program will convert to GMT for those time zones found in the United States. If none of these time zones apply, you may use a numeric time zone designation: input the number of hours needed to add to the local time to convert it to GMT. For example, to convert PST to GMT you must add hours, so answer the time zone question with either 'PST' (in upper case letters) or '8', which will give the same results. (For time zones listed the question is displayed, first two letters of the designation are significant. Thus, 'PS' and 'PST' will be recognized as being the same. Also, 'PDT' and 'PWT' have the same value--if the second letter entered is not an 'S', it will be assumed to be advanced one hour as are Daylight Saving and War Times.) For a time zone east of Greenwich, enter a negative number. For example, for the Middle European Time zone, input a '-1'. For any time zone not listed as a choice on the screen, simply enter the number of hours to correct that time zone to Greenwich Mean Time. If an area is a fractional number of hours from Greenwich, for example $-8\frac{1}{2}$, convert and input the GMT birth time. Note that the default for the time zone question is GMT. If you answer with just an [ENTER], GMT will be assumed. After answering all the questions concerning birth data, you are given a chance to correct any data. Be sure to check your input. If you've made an error in, say, the time, continue answering the questions with just an [ENTER] until you reach the question DO YOU WANT TO CHANGE ANY DATA. Answer this with a '1' and you will be asked to again enter the birth data. With a CP/M system, once you have entered the six required pieces of information, they are all displayed and you are given a chance to correct any or all of them by selecting a number between 1 and 6. When you are satisfied the data is correct, hit [ENTER] and then type in a name (just [ENTER] is acceptable).

Much information is produced by this section (see the Appendix for sample output). The first line of print-out and/or screen display will be the name you have given the chart, the birth data including GMT, and the latitude and longitude which are assumed north and west unless preceded by a '-'. This is followed by several columns of numbers. The first column is the normal geocentric longitude of the planetary positions. In our sample you'll see Reagan's Sun is 16 degrees 25 minutes 31 seconds of Aquarius. The next column is geocentric latitude; this dimension is not very well known, but it is the perpendicular dimension to longitude, just as on earth.

The third and fourth columns are the heliocentric (Sun-centered) longitude and latitude. While most astrologers use geocentric charts which measure the planets as seen from the earth, there is an increasing interest in the positions as seen from the Sun. Notice that the Moon and node have no heliocentric position listed since their positions would be the same as the earth, and that the position of the earth is directly opposite that of the Sun in the geocentric chart. (NOTE: There is no Sun position in a heliocentric chart and the position of earth will be shown as the Sun.) The next two columns are the right ascension and declination for each planet. These are the horizontal and vertical positions of the planets as measured with respect to the celestial equator, which is the terrestrial equator projected out from the earth. While latitude is the deviation above or below the ecliptic (apparent path of the Sun), the deviation above or below the celestial equator is the declination. The ecliptic is the apparent path of the Sun. The final two columns are azimuth and altitude--two more measures in another coordinate system which is increasingly being investigated. These coordinates are measurements relative to the horizon and are very locality-centered. This system is referred to either as "topocentric" (not to be confused with the Topocentric house system) or "local space". Azimuth is the measurement of positions along the horizon. Unfortunately, there is no "standard" of measurement. On TRSDOS versions of Astrostar, we have measured Azimuth from a 0 degree at the East Point rotating clockwise with 90 degrees at the South Point and 270 degrees at North. (This is the system used in astrological PROGRAMS for Radio Shack computers by other software publishers.) For the CP/M version we have used the more logical system of 0 degrees at the East Point rotating counter-clockwise (as house systems do) with 90 degrees at the North Point and 270 degrees at the South Point. Altitude is the distance above or below the horizon. Reagan's Sun has an azimuth of 318:20 in the TRSDOS system (41.40 in the CP/M version) and an altitude of -56:06 which indicates that the Sun is in the NE and well below the horizon. You may notice that sometimes a planet, most commonly the Moon and Pluto, can appear above the horizon in a regular chart but have a negative altitude (and, of course, vice versa). This illustrates the possible effect of latitude, and shows that the standard chart can sometimes give misleading information. Some items to look for in local space are parallels and contraparallels in altitude, the most elevated and the lowest planets, planets on the horizon (use SORT option to see these clearly), and planets at cardinal points of the compass (0, 90, 180, 270) in azimuth.

The next screen display asks: PRIMARY COORDINATE: 1) GEOCENTRIC (DEFAULT) 2) HELIOCENTRIC 3) EQUATORIAL 4) TOPOCENTRIC. This option allows you, for example, to examine the aspects and midpoints in heliocentric longitude, or compare the right ascension of two different charts. If you just want the standard geocentric longitude, merely hit the ENTER] key. The next question is DO YOU WANT SORTED POSITIONS (0/1). Answering yes (1) will display each of these eight coordinate sets sorted in ascending order. Note that the Moon's heliocentric longitude and latitude are both zero when sorted. Sorting makes it very easy to see parallels and contraparallels, for instance, as well as aspects in any of the four horizontal dimensions. For convenience the right ascension and azimuth are given in zodiacal format which helps to see aspects at a glance (i.e. Taurus is square Leo); however, these signs are not to be confused

with the geocentric signs of the zodiac. With azimuth, all planets between 0 Aries and 0 Libra are in the South in TRSDOS systems (North for CP/M systems), while all planets from 0 Cancer to 0 Capricorn are in the West (both systems), and all planets with positive elevation are above the horizon. If the program is set for Uranian planets, neither of these options should be chosen until the Uranian planets have been calculated.

Next the elements and modes are displayed, followed by the four angles of the chart: Ascendant, Midheaven, Vertex, and East Point. These last two points have only been studied recently, and meanings for them are still theoretical. The Vertex is the crossing of the ecliptic and the prime vertical--that great circle from due east to due west through the zenith--and is due west; the East Point or Equatorial Ascendant is the Ascendant for those born at the equator. It is not necessarily due east (that is the Antivertex)--it is simply at right angles to the Midheaven as measured along the celestial equator. In the Meridian house system the East Point is the cusp of the first house. The Vertex is said to represent "fated" contacts, and the East Point to be the way you think you project yourself, as opposed to how you actually project yourself, which is the Ascendant. After this a house system is selected and the planets are displayed in those houses. You can then either select another house system, or save that system and those houses on the disk for further use. If you plan on doing anything else with the chart other than a one-time analysis or printing a full-page chart, it should be stored, using a maximum 22-character name (also referred to as "ID") to identify the chart. If you chose a primary coordinate other than geocentric longitude these positions will appear in the houses and will be stored on the disk. Unfortunately, the declination or altitude of the Sun won't be stored in TRSDOS systems. If you have chosen a non-quadrant house system--i.e., the Ascendant and Midheaven are not the first and tenth house cusps - the Ascendant and/or Midheaven won't be stored and any analysis using those points from that chart will incorrectly label the MC and AS.

CHAPTER FIVE --- ANALYZE A CHART

The chart analysis section gives you a number of options. When this program is first loaded, the computer asks what chart is to be analyzed: the chart just calculated (natal, return, progressed, relationship, etc.), a chart to be input a position at a time from the keyboard, or a chart from the file. If you input a chart from the file, you will be asked how many points you want to use; if you just hit [ENTER], you will use the full number of points stored. The next question is HORIZONTAL (DEFAULT) OR VERTICAL COORDINATES which allows you to use the vertical coordinate (latitude, declination, altitude) for analysis. (If you use this option on a chart from the file, the Sun's declination or altitude will be 0. (This is an eccentricity of the TRSDOS program only.) Normally just hit [ENTER] to choose the default option. If you choose vertical, do not use horizontal coordinates without reloading the chart. Next will appear the Analysis Menu (Figure 3); this menu may vary depending on the program version, but the essential ideas will be the same.

DISPLAY PLANETS will merely show the planets in their houses; ANOTHER CHART will accept new data for another chart to analyze; and OTHER FUNCTIONS returns you to the main menu.

ASPECTS

The Aspect Menu (Figure 3) gives you a number of choices: LIST ALL ANGLES allows you to see the exact angle—degrees and minutes—between all pairs of points, in planetary order (Sun-Moon, Sun-Mercury, etc.). LIST ALL ASPECTS will compare each angle with the Aspect Dictionary (described below) and display those planetary pairs which make aspects, along with the orb. SORT ASPECTS BY RELATIVE ORB takes the aspects and sorts them by ascending relative orb which is the actual or absolute orb divided by the total allowable orb for that aspect; a relative orb of .000 means that the aspect is exact, while a value of 1.000 means the orb is the maximum possible. As an example, suppose there are two planets six degrees apart and the orb for a conjunction is 12 degrees; the relative orb would be .500. The idea behind relative orb is that the strength of an aspect depends not only on the narrowness of the orb (closeness to partile, or exactitude) but also the type of aspect—a conjunction of three degrees is more powerful than a square with orb of three degrees. Relative orb takes both these factors into consideration. SORT ASPECTS BY ABSOLUTE ORB lists the aspects sorted by the actual orb, so that an aspect with orb of two degrees will be listed after an aspect with orb of one degree. SORT ANGLES will list all angles in ascending order from 0 to 180 degrees. This makes it easy to see what angles group around a certain value. For example, the angles clustering around 72 degrees will all be quintiles and you can immediately see the orb. This option is useful if the orb you use depends on which planets are involved in the aspect. LIST ANGLES TO A POINT allows you to see the angles between all points and one particular point: the point can either be one calculated (1=Sun, 2=Moon, etc, through 11=North Node, 12=Ascendant, 13=Midheaven) or your own value for a point. LIST ASPECTS TO A POINT operates the same way but lists aspects instead of angles. LIST ASPECTS TO MIDPOINTS will give every aspect to every

midpoint as well as the orb. This will result in a large amount of output since there are usually two or three aspects for each midpoint, given regular orbs. Before using this option you may want to eliminate some aspects and narrow some orbs in the dictionary. OTHER FUNCTIONS returns you to the Analysis Menu.

ASPECT DICTIONARY

AstroStar uses an Aspect Dictionary to tell what aspects to check for and the orb for each one. When the program is run a default Aspect Dictionary, shown in Figure 4, is loaded, which can be changed in the program using various dictionary change options. It is also possible to change the default dictionary permanently to one more in keeping with your work habits. To do so first change the dictionary as shown below and when you are satisfied with the resultant dictionary, exit the program. From the 'DOS READY' command type in 'TAPEDISK' (needless to say that program must be on your disk); once you get the '?' prompt respond with 'F STAR/CMD:0 54F5 BF08 5C40' which will save the new program on drive 0 under the name 'STAR'. All files with the type '/OVR' must also be on the disk with STAR. To run the new program, type 'STAR' instead of 'RUN'. With CP/M, once you have exited the program, use SAVE 112 A:STAR.COM and henceforth use STAR instead of RUN.

ASPECT	ORB	SYMBOL	
0.00	12.00	CON	24
30.00	1.00	SSX	
45.00	1.30	SSQ	
60.00	2.00	SXT	
90.00	3.00	SQR	
120.00	4.00	TRI	
135.00	1.30	SQQ	
150.00	1.00	QCX	
180.00	6.00	OPP	

FIGURE 4: ASPECT DICTIONARY

The Aspect Dictionary lists all angles which will be considered an aspect, the orb to be used, and the abbreviation for that aspect. In other words, a conjunction (angle 0) will have an orb of 12 degrees and be represented by the abbreviation CON. The orbs in AstroStar's default dictionary are those used in John Addey's book Harmonics in Astrology, in which each orb is proportional to the harmonic of the aspect—see the book for a complete discussion—so that the orb for an opposition is half the orb for a conjunction, since an opposition is based on harmonic 2 and a conjunction on harmonic 1.

There are several ways to modify the dictionary: ADD ASPECT TO DICTIONARY allows you to add a single aspect, along with its orb and abbreviation. For example, you can add the angle of 110 degrees, orb of 36 minutes and symbol ABC to the dictionary. With this addition, all angles within 36 minutes of 110 degrees would be found and displayed by any option that uses aspects. ADD GROUP OF ASPECTS allows you to add a whole family of aspects to the dictionary at one time, i.e., those of a particular harmonic. Choosing '5' in answer to the prompt which results from choosing this option will add both the quintile and biquintile to the dictionary. The choices of harmonic numbers and corresponding aspects, orbs and symbols are shown in Figure 5.

<u>Number</u>	<u>Aspect</u>	<u>Orb</u>	<u>Symbol</u>
5 (Quintile family)	72	2.24	Q
	144	2.24	BQ
7 (Septile family)	51.26	1.43	S
	102.52	1.43	BS
	154.18	1.43	TS
9 (Novile family)	40	1.20	N
	80	1.20	BN
	160	1.20	QN
10 DECADE	36	1.12	110
	108	1.12	310
16	22.30	.45	116
	67.30	.45	216
	112.30	.45	316
	157.30	.45	416
24	15	.30	124
	75	.30	224
	105	.30	324
	165	.30	424

FIGURE 5: Other Aspects Available

The aspect dictionary will hold a maximum of 25 aspects. The message DICTIONARY FULL will be produced if this limit is reached. DELETE ASPECT FROM DICTIONARY will eliminate a specified aspect from the dictionary. CHANGE ORB allows you to change the orb of a specific aspect, while CHANGE ALL ORBS will list every aspect and the corresponding orb, and allow you to change each one. If you reply to the new orb question with just an [ENTER], that orb will remain as it is and move you to the next orb listing. In this way a major dictionary change can be done quickly and easily. Finally DISPLAY DICTIONARY will print the entire dictionary, much like Figure 4.

MIDPOINTS AND HARMONICS

In the last few years midpoints have been used by more and more astrologers. Midpoints, or half-sums, are literally the middle of two points. For example, if the Sun is 5° Aries and the Moon is 15° Leo then the Sun-Moon midpoint (written Sun/Moon) is 10° Gemini; the Sun and Moon are both equidistant--65 degrees--from this point and on either side of it. Midpoints combine the nature of both points involved, and thus are more specific than an individual planet. They become quite important when conjunct or in aspect to a third point. Midpoints can give information which is not easily available through other chart analysis techniques. Suppose the Sun is conjunct the Moon-Jupiter midpoint, written SO=MO/JU, for a native. This indicates something about his/her true nature as represented by the Sun and suggests that she/he is optimistic, generous and happy. Everyone should at least pay attention to the direct--harmonic 1--midpoints, with an orb of two degrees or so. For interpretation of midpoints see Combination of Stellar Influences, by Reinhold Ebertin.

The midpoint section can show you midpoints in a couple of ways. If you choose LIST ALL MIDPOINTS you will see them in planetary order, which is useful if you want to find a certain midpoint. MIDPOINT STRUCTURES will display the midpoints contacting points in the standard cosmobiological format of planet=planet1/planet2 along with the difference between the actual midpoint and the main point. Before this is listed out, you will be asked for the harmonic--1 is 360 degree dial for direct midpoints, 4 is 90 degree dial--and the orb. Midpoint contacts outside this orb will be ignored. If a harmonic of 0 (or [ENTER]) is chosen, you will return to the Analysis Menu. DONE will do the same thing. Note that when, for example, you specify the fourth harmonic you will see a planet listed as connected to a midpoint if it makes a multiple of 45 degrees (eighth harmonic) aspect to the midpoint. This "doubling up" happens because for any two points there are two midpoints opposite one another. Midpoints are also used in harmonic sorting (see below) and with aspects.

Option 3, HARMONICS, is another method of seeing interrelationships between points. This harmonic sorting routine allows you to sort the planets only, or the planets and midpoints for any harmonic from one to 127.

Using these sorts you can see aspect patterns quickly. In a harmonic sort, all aspects of that family are seen as conjunctions; for example, in a fourth-harmonic sort all squares, oppositions and conjunctions appear as conjunctions, while the semisquares and sesquiquadrates--based on the eighth harmonic or half of the fourth--appear as oppositions. T-squares appear as triple conjunctions in this sort. You can also see midpoints which are involved in any aspect patterns. In these harmonic sorts, the points are listed in zodiacal format within the range 0° Aries to 30° Pisces so that you can easily see aspects within that harmonic. For example, suppose two planets are at 15° Taurus and 16° Scorpio in the seventh harmonic chart. Since a conjunction in the seventh chart can represent either a septile, biseptile or triseptile, the corresponding aspect is half of one of those, or a semiseptile, and the actual orb would be one-seventh of the apparent orb of one degree.

CHAPTER SIX ---- RETURNS

With the returns program--both solar and lunar--you first have the choice of tropical, tropical with precession correction, or sidereal zodiac. In the precession-corrected method, the return position is different from the natal position since an allowance is made for the amount of precession of equinox between birth and the date of return so that this return is similar to the sidereal return except that it is cast in the tropical zodiac. In the course of 36 years the angles in this return will be 180 degrees different from those in the tropical return. Many astrologers think that the precessed or sidereal return is more accurate than the tropical return.

AstroStar then asks which kind of return chart is to be calculated: 1) FULL 2) HALF 3) FIRST QUARTER 4) LAST QUARTER return. The full return is the type most often used; the half return calculates the return to a position opposite the natal position, for projections for the half year or half month; and the quarter returns use a return position either 90 degrees or 270 degrees from the natal position. Next you will be asked which CHART TO CAST RETURN FOR--a chart from the files--the LOCATION FOR RETURN, and an APPROXIMATE DATE OF RETURN with month and year. Occasionally when there are two lunar returns in a month you will not get the correct one on the first try; stepping will correct this. At the end of the first return you will be asked if you want another. If you answer with a '1', you will then be asked DO YOU WANT TO STEP. This stepping function allows you to construct any number of consecutive returns of the same type, as long as you continue stepping. For example, if the first return was half lunar precession-corrected, other returns of the same type for each half month after that will be calculated so that you can do a full year's worth of half lunar returns easily. The message STOP STEPPING (ENTER TO CONTINUE) allows you to return to the Main Menu at any time by inputting '1'. Since you can do a return for any chart, you can easily do a kinetic return--the return of the Sun or Moon to the position it occupied in a secondary progression. First calculate a secondary progression and then use that chart as the basis of the return.

CHAPTER SEVEN --- PROGRESSIONS AND DIRECTIONS

The progressions and directions section allows you to construct several different types of these dynamic charts. The natal basis for the dynamic chart is taken from a chart already in the chart file. You are asked if this is to be direct or converse. A converse progression is calculated for the same number of days before the event that the direct progression is after the event, and for a converse direction the amount of arc is subtracted from the natal positions instead of added. You must also select tropical or sidereal zodiac. You are then asked for the date, time and location for the progressed event. In most cases the time questions can be answered with just an [ENTER], since 24 hours doesn't make much difference in a progression, and unless you are doing a quotidian you can answer the latitude and longitude questions with an [ENTER] also. In other words, all questions except for DATE can be answered with [RETURN].

In general, progressions use a formula of X number of days after (before) birth in ephemeris time being equal to 1 year after birth in real time; therefore, a progressed chart is always a real chart. SECONDARY progressions are the most common type and the non-specific term "progressions" generally refers to secondary progressions where one day after birth (the value for X) is equated to one year after birth, and so the chart drawn up for thirty days after birth will provide information about the thirtieth year of life. MINOR progressions equate one lunar month (27.32 days) after birth to one year of life, so that progressed motion is more rapid than with secondaries. TERTIARY progressions, invented relatively recently in Germany, equate one day after birth to one lunar month of life, or some 13.37 days per year. The DAY-FOR-A-WEEK and DAY-FOR-A-MONTH progressions are just what the names imply. You may also define your own type of progression through the OTHER option. With this you are asked for the number of ephemeris days equal to a year of life, in units of days and sixtieths of a day--5.12 represents 5 and 1/5 days. If '1' is input in this section, secondary progressions result.

There are many ways of calculating the angles in a progressed chart. The most popular, if not the most consistent, is the SOLAR ARC method in which the Midheaven of the natal chart is advanced by the motion of the secondary progressed Sun to give the Midheaven for the progressed chart, and the appropriate Ascendant is calculated for the natal location given that new Midheaven. Alternatively, the secondary SUN'S MEAN MOTION IN RA--equatorially and not ecliptically, which is a fairly consistent 59' 8" per day (per progressed year)--is added to the right ascension of natal Midheaven to calculate a new Midheaven, and then the operation proceeds as in the first method. In the QUOTIDIAN method the angles are calculated for the progressed date, time and the given location. In the first two methods the Midheaven advances by about one degree per year, so there is not that much variation. In the quotidian method the angles advance some 361 degrees; there is greater variation during the course of a year and the resultant chart is more location-specific than other methods.

In directing a chart a fixed arc is added to each point to construct a new chart which obviously does not represent a real planetary configuration--it is purely artificial. All the aspects are the same as in the natal chart. We

gather information by comparing the directed to the natal chart. The program gives many different methods of directing a chart from the files. In SOLAR ARC the difference between the natal Sun and the secondary progressed Sun is added to each position. HALF SOLAR ARC and DOUBLE SOLAR ARC are self-explanatory. SUN'S MEAN MOTION arc adds $59' 8''$ ($360 \text{ degrees} / 365.25 \text{ days}$) per year to each position. ONE DEGREE PER YEAR uses an arc of one degree for each year of birth; DUODENARY is a method introduced by Charles Carter in which $2\frac{1}{2}$ degrees are allowed for each year after birth. QUARTER DEGREE ARC, described by Charles Jayne, uses a measure of .250 degrees per year. ASCENDANT ARC uses the difference between the natal Ascendant and the new Ascendant calculated from the solar-arc directed Midheaven to advance each natal position, while the VERTICAL ARC uses the same method except with the Vertex rather than the Ascendant. And finally the OTHER option gives you the choice of defining your own direction measure, in degrees and minutes.

CHAPTER EIGHT --- COMPARISONS

This section allows you to compare two charts by a number of different methods. Note that besides comparing the natal chart of two different people, you can also compare a directed chart with a natal chart or the current transiting positions with a natal chart. The program will ask you one at a time for the ID's--the names used to store the charts in the file--for the two charts you wish to compare. The most common method of chart comparison is to calculate the interaspects, the ASPECTS between the points in one chart and the points in the other chart. You may also look at the contacts between points in one chart and MIDPOINTS in the other. A third method is to place the planets from one chart in the HOUSE structure of the other chart. In all these three instances, the program will present you with two sets of comparisons, with each person's planetary positions aspected to the other person's planets. Another method of chart comparison is the COMPOSITE chart which is an artificial chart computed by taking the closer midpoint of the same planet from the two charts. In other words, the composite Sun is the midpoint of A's Sun and B's Sun. A RELATIONSHIP chart is an actual chart computed for the date, time and location half-way between the natal dates, times and locations. A relationship chart cannot be calculated if the two stored charts do not include birth data.

CHAPTER NINE --- INITIALIZE THE FILE

TRSDOS

Before you can begin to store charts on the file you must first initialize it. This process is done once for each file you use. If you have two disk drives you may have several files on different disks, for example one for clients, one for friends, and one for a research project. This section of the program sets aside a given amount of the disk for the storage of charts, so before using it you should determine the amount of free space on that disk by using the command FREE from the 'DOS READY' level. Fifteen charts can be stored per granule of free space. Upon entering the initialization module you will be asked if you are sure this is something you really want to do; since this process will wipe out any file with the name "ASTRO" on the disk, you are given a chance to say no. If you answer this question with '1', you will then be asked for the drive to put the file on, which allows you to use other drives on a multiple-drive system. Note that if you have "ASTRO" files on drive 0 and drive 1, the file on drive 0 will always be accessed by the program for chart storage and recall. Next you will be asked MAXIMUM NUMBER OF ENTRIES which will size the file. The program will then write out a blank file for that many charts and then return to the Main Menu.

CP/M SYSTEMS

The CP/M version will store and access charts in many different files. Files must be initialized before storing charts. Before initializing a file the name must be specified by either entering Astrostar by typing RUN FILENAME, or, if already in Astrostar, by selecting option #11 and following the prompts to CHANGE A FILENAME. The currently designated file is then initialized by selecting #10. In option 10, INITIALIZE FILE, you will need to know how much disk space to allocate for the file. When asked MAXIMUM NUMBER ENTRIES you may give any amount for which there is room on that disk. Each "K" of available space will hold 8 charts. Eight hundred charts in one file would require 100K. One thousand charts would take 125K. (Available space can be determined by using CP/M's STAT command). Several chart files can be on one disk with different names, or with the same name on another disk. These can be accessed by designating both the drive and the filename e.g. B: Clients for the "Clients" file on drive B. If the program is loaded by just typing RUN, the accessible file is the default ASTRO on the same drive as Astrostar. If you type RUN B, the program will access the ASTRO file on drive B. If you type RUN B:ALPHA, the expected file will be ALPHA on drive B. If you are in the program and want to access another file, use option 11--CHANGE FILE NAME. This will ask you to ENTER NEW FILE NAME (DRIVE:NAME). Answer with standard CP/M filename terminology, such as CLIENTS.FEM for female clients. For example, suppose you've finished with file ASTRO on drive A and want to use the file CLIENTS on drive B. Select option 11 from the Main Menu and answer with B:CLIENTS.

CHAPTER TEN --- MANIPULATE THE FILE

Once you have a number of charts stored in the file, you will need a way to see what's stored. The MANIPULATE THE FILE routines provide the means to do so. The PRINT CHART option will display the planets in the houses for a specified chart and on either the terminal or printer. DELETE asks for the name of a chart to be eliminated from the file. PURGE works in much the same way except that each chart ID will be listed and then you will be asked if you want to delete it. Answering with just [ENTER] will leave the chart in the file while '1' will delete the chart so you can easily eliminate many charts from the file at one time. CREATE allows entering a chart a position at a time from the keyboard in a degree.sign.minutes format, and also input of the non-angular house cusps, the latitudes and the birth data.

With CREATE asteroids or other points not computable by the program can be entered, as well as charts given in magazines which do not include birth data. LIST prints all chart ID's on the terminal or printer as well as some additional information--the number of points stored, and the letters 'CDL', any or all being replaced by '-'. The 'C', if present, indicates that the house Cusps are stored; the 'D' means that the birth Data is stored; and the 'L' means that the Latitudes are stored. Composite and directed charts which do not contain this data have Porphyry cusps computed when the chart is read in. Uranian charts will have 21 points stored, and thus, the latitudes will not be present in the TRSDOS version. Whenever a chart is read in from the file you will be told how many points are in the chart (13 for most non-Uranian charts) and asked how many points you want. If you are satisfied with the number present, just hit [ENTER]; if you have 21 points and only want to look at 13, input '13' in answer to the question. DISPLAY BIRTH DATA gives the birth data--date, GMT, latitude and longitude--for a specified chart. Finally CLOSE allows you to return to the Main Menu--the file should always be closed before ending this sub-program.

CHAPTER ELEVEN --- PRINT A CHART

This section prints a full-page chart on the printer, with either standard planetary abbreviations (see table next section) or the standard glyphs on an IDS Paper Tiger printer and the Epson Graphtrax printers, even if output in other sections of the program is only on the terminal. But don't use this selection if you don't have a printer. Upon entering the program you will be asked PRINT 1) CHART JUST CALCULATED (DEFAULT) OR 2) CHART FROM FILE. Experiment with the default option to make sure you understand when a chart has been "just calculated". With the TRSDOS version, once a chart has been printed the "just calculated version" is scrambled, so don't try to use it further. If you want to print multiple copies of a chart, first store it in a file. It is possible to calculate a chart with Main Menu option 1, analyze it with option 2 and print it with option 7 without storing the chart in the file. With this default choice the printer will start wherever it is located, so be sure to move the paper to the top of form before printing starts. The paper will not advance after the chart is printed. The next question asks for a name to be printed on the chart. If option 2 is selected, REPEAT COUNT appears. If only one copy of each chart is wanted just hit [ENTER]. Otherwise, enter the number of copies wanted of each chart. This is valuable for classroom work. The next prompt asks for the ID's of each chart to be printed. Answer with one chart per line. When you have entered them all, type DONE (no quotes) as the last ID, or just [RETURN] on a CP/M machine. There is a limit of 25 charts at one time. It is a good idea to be sure of all the ID's and their correct spelling before beginning. A page eject will be issued after each chart, so be sure the paper is properly lined up before the first chart. If an ID is not found, the display will say so, ignore it, and go on. When this program is finished, it will return to the Main Menu.

CHAPTER TWELVE --- UTILITIES

There are a number of small utilities available with AstroStar. For both the CP/M and TRSDOS versions there is the Main Menu option of changing the output device (8) from terminal to printer to both. If you are using the TRSDOS version and a graphics printer, you will have problems changing from printer to terminal; exit from the program and reload it in order to have things work correctly.

The options which do a line feed (12) and a form feed (13) are fairly obvious; these allow you to control the paper without putting the printer offline. At any point where a response is expected, a CONTROL-N (hold down the CONTROL key and while doing so press N and then [RETURN]) will return you to the Main Menu. When you do this, you may find that output which had been going to the printer is now going only to the terminal; this can happen only in a few special cases. CONTROL-S stops the listing on the terminal; another CONTROL-S starts it again; a CONTROL-P will duplicate terminal output on the printer (a second CONTROL-P will turn off the printing), and CONTROL-C will return you to CP/M.

The option 14) STORE CURRENT CHART allows you to move a chart from one file to another, for comparisons or whatever. First use the Analysis section to load the chart, then return to the Main Menu and change the file name; finally store the chart in that file with this option. Be careful! If you have garbage when you use this option you will also store it as a chart.

CHAPTER THIRTEEN --- ADVANCED FEATURES

AstroStar has many features which you can avoid knowing anything about by always using the default choices. These are the choices that most astrologers use and are called by just hitting the carriage return button. But for experimental work, for developing new techniques and exploring new horizons, these other options are available. The purpose of this section is to indicate that these possibilities exist.

There are four different coordinate systems calculated by the program given birth data: Geocentric, Heliocentric, Equatorial and Topocentric. Almost all astrologers use just the first system. Currently the heliocentric system is being tried by an increasing number of astrologers, and heliocentric and geocentric positions are being compared to provide more information. In order to use the heliocentric positions as calculated, just choose heliocentric when that question appears after calculating a chart. It is quite easy to calculate aspects, midpoints and so forth for a helio chart, just as you do so for a geo chart. All the AstroStar options--except returns, see below--work with all coordinate systems. Once you have calculated a geo chart and stored it on the disk, you can calculate a helio chart based on the same data without re-entering the data. To compare geo and helio charts, just store both on the disk and then use the comparison sub-program.

Everything which can be done to geocentric and heliocentric charts can also be done to equatorial and topocentric charts, so you can look at midpoints in azimuth and calculate the aspects in right ascension.

Note that returns only work in the geocentric coordinate system, since a solar return calculates the time the geocentric Sun returns to the same position as the Sun in a given chart. If the Sun in question happens to be the azimuth of a Sun, the solar return will be for the time the geocentric Sun is at the same position in the ecliptic that the Sun's azimuth is relative to its fiducial--the east point.

When analyzing a chart, you are given the choice of using the horizontal or vertical coordinates; most use the horizontal. For the four coordinate systems given above, the vertical coordinates are called geocentric latitude, heliocentric latitude, declination and altitude. It is possible to calculate aspects, midpoints and harmonics in these vertical coordinates also. There has been a little research on midpoints in declination. Altitude would offer the widest range of aspects since altitudes vary more than any of the other vertical coordinates. It is quite possible to calculate midpoints in heliocentric latitude if you so wish.

TECHNICAL SECTION

To use AstroStar it is not necessary to understand or even to read this section. However, if you want more information on the internal workings of the system, read on.

AstroStar is written completely in Z-80 assembly language. The main program occupies approximately 26,000 bytes. Most options in the Main Menu are performed by various overlays which, when selected, are loaded into core directly above the main section. The use of overlays allows running a program which is larger than the size of memory. It also becomes possible to write other modules, such as AstroStar's TransitScan overlay, which can be added at any time to extend the usefulness of the program. These add-on modules will be selected by using Main Menu option RUN OWN PROGRAM OR RUN ASTROSTAR PROGRAM. To try this out, pick this option. Answer the next question with 'EPHEM' and you will get the same result as if you had picked option 1.

The use of assembly language allows many functions to be included in a small amount of memory. Assembly language is also up to 10 to 100 times faster than BASIC, and is also faster and more memory-efficient than a compiled language such as FORTRAN. Preliminary versions of AstroStar were written in both these languages. This speed advantage of the final version is most noticeable in the calculation of planetary positions and the computation of angles, aspects and harmonic sorts.

The Sun's position is computed using the method of Simon Newcomb. Other planetary positions are computed by an iterative summation method which is extremely well-suited for assembly language. Accuracy for the Sun's position should be within a couple of seconds of arc for the last three centuries, and the Moon should be accurate to within a quarter-minute for the same period. The other planets should be accurate within one minute, occasionally two, for the period 1700--2300, except for Pluto which can be off as much as 15 minutes. Before 1700 and after 2300 the accuracy falls off gradually but increasingly so for years further from 2000--the period of epoch. As an example of the amount of inaccuracy you may expect, here is a list of the difference between values calculated by AstroStar and those from Astro Computing Services for 1066 AD and 330 AD:

Planet	1066 AD	330 AD
Sun	-2'	-8'
Moon	-1'	-24'
Mercury	-2'	-11'
Venus	-3'	-8'
Mars	-1'	-8'
Jupiter	+1'	-9'
Saturn	-13'	+10'
Uranus	+6'	+65'
Neptune	-9'	+52'
Pluto	+7:13	-19:27

And as far back as 46 AD all planets except Pluto are within one degree; don't ask about Pluto.

Geocentric calculations are for apparent positions, with correction for aberration (for the Sun) and nutation. No correction has been made for delta-T, which is negligible for recent dates but greater in the past. The Julian calendar is assumed for dates before October 6, 1582; allowance must be made if you compute a chart for a location where the change from the Julian to Gregorian calendar happened at a later date.

(NOTE to TRSDOS owners: AstroStar should be completely compatible with NEWDOS-80; however, always use the TRSDOS version of BASIC, since the Apparet-modified version gives incorrect results for the chart angles.

FILE DESCRIPTION

This section describes the internal storage structure and provides a sample BASIC program for accessing charts from the file.

Angles and planetary positions are stored in packed format with one angle per 16-bit word; the degrees are stored as bits 15-6 and the minutes in bits 5-0, with bit 15 the sign bit. Special subroutines add, subtract, compare, and find the midpoint of and find the Nth harmonic of angles in this format.

On a TRSDOS disk three charts are stored per 256-byte physical record, in the following structure: Bytes 0--21 are the 22-character ID; byte 22 is the information word described below; bytes 23 and on are the longitudes, with Sun's longitude in packed format in bytes 23 and 24, with byte 24 the most significant (standard Z-80 format); if only 13 longitudes are stored--see table below--then latitudes are stored in bytes 49--66, with Moon's latitude in 49 and 50; cusps 11, 12, 1 and 2 are stored in bytes 67--74; byte 75 is the month of the event; byte 76 is the day; bytes 77 and 78 are the year; bytes 79 and 80 are the GMT in packed format; bytes 81 and 82 are the latitude of birth; and bytes 83 and 84 are the longitude. Note that if planets beyond 13 are stored they are expected to be the eight Transneptunian planets of Uranian astrology and the four commonly-used asteroids, even though any planet can be used. The following table indicates the storage order of the planets and their abbreviations, as well as the sign abbreviation:

1	Sun	SO	14	Cupido	CU
2	Moon	MO	15	Hades	HA
3	Mercury	ME	16	Zeus	ZE
4	Venus	VE	17	Kronos	KR
5	Mars	MA	18	Apollo	AP
6	Jupiter	JU	19	Admetos	AD
7	Saturn	SA	20	Vulcanus	VU
8	Uranus	UR	21	Poseidon	PO
9	Neptune	NE	22	Ceres	CE
10	Pluto	PL	23	Pallas	PA
11	North Node	NO	24	Juno	JO
12	Ascendant	AS	25	Vesta	VA
13	Midheaven	MC			
1	Aries	AR	7	Libra	LI
2	Taurus	TA	8	Scorpio	SC
3	Gemini	GE	9	Sagittarius	SG
4	Cancer	CN	10	Capricorn	CP
5	Leo	LE	11	Aquarius	AQ
6	Virgo	VI	12	Pisces	PI

CP/M FILE STORAGE FORMAT

Under CP/M the charts are stored one per each 128-byte physical sector. Storage is similar to that under TRSDOS with the following changes: longitudes are stored in bytes 23 through 66, and latitudes, including the Sun's, are stored in bytes 85 through 127.

Charts are located in the file by a simple hashing algorithm which locates the page (three charts per page) on which the entry will be placed. The hashing algorithm takes the bottom 4 bits of each of the first four characters of the ID (with the first character forming the lowest four bits) and forms a 16-bit number. The process is then repeated for the next four sets of four characters and the five resulting 16-bit numbers are added in turn. The remainder after dividing by the number of pages in the file gives a number which locates the page (256-byte physical record or sector) on which the chart should be located. If there is a hash collision and the specified page contains three charts, none of which is the chart desired, the entry will be placed in the next available location forward sequentially in the file, with wrap around occurring to the beginning of the file.

When all the ID's in the file are listed out, each is followed by the CDL information word. This data is from byte 22 of the record, the information word. The lower 5 bits of this byte indicate the number of points stored in the chart minus one; in most cases this will be 12. Bit 7 is set high if the cusps are also stored, bit 6 if birth data is stored, and bit 5 if the latitudes (or other vertical coordinates) are stored. Charts inputted from the keyboard may not contain that data to make room for up to 25 points.

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Astrology Now is no longer published, but back issues may be available from Llewellyn Publications, 213 East 4th Street, St. Paul, MN 55101. Issue 27 is devoted entirely to Computers and Astrology.

```

10 DEFINT I-N
20 CLEAR 200
30 DIM PL(13),NM(4)
40 OPEN"R",1,"ASTRO"
50 A$="":INPUT"WHAT ID--MAXIMUM 22 CHARACTERS";A$
60 IF A$="" THEN CLOSE 1:STOP
65 REM BLANK FILL NAME
70 A$=LEFT$(A$+STRING$(22," "),22)
80 NO=0
85 REM FOR EVERY CONSECUTIVE STRING OF FOUR CHARACTERS
90 FOR I=1 TO 19 STEP 4
100 B$=MID$(A$,I,4)
105 REM GET VALUE OF BOTTOM FOUR BITS OF EACH CHARACTER
110 FOR J=1 TO 4
120 D$=MID$(B$,J,1)
130 NM(J)=ASC(D$) AND &HF
140 NEXT J
145 REM FORM A NUMBER FROM THESE FOUR SETS OF FOUR BITS
150 N=NM(1)+NM(2)*16+NM(3)*256+NM(4)*4096
155 REM ADD THESE FIVE NUMBERS
160 NO=NO+N
170 NEXT I
180 NR=LOF(1)
185 REM GET MODULO BY FILE SIZE
190 IR=NO-FIX(NO/NR)*NR+1
200 IR=IR-1:IF IR=0 THEN IR=1
210 GET 1,IR
215 REM FOR TRS: FOR J=1 TO 3
216 REM FOR TRS:220 FIELD 1, (J-1)*85 AS S$, 22 AS ID$
220 FIELD 1,22 AS ID$
230 IF ID$=A$ GOTO 270
235 REM FOR TRS: NEXT J
240 IR=IR+1
250 IF IR>NR THEN IR=1
255 REM CHECK NEXT RECORD OF NAME
260 GOTO 210
265 REM PICK OUT INDIVIDUAL PLANETS
270 FOR J=1 TO 13
280 FIELD 1, 23 AS ID$, (J-1)*2 AS P$, 2 AS PL$
290 NP=CVI(PL$) AND &H7FFF
300 PL(J)=FIX(NP/64)+(NP AND &H3F)/100
310 PRINT J;PL(J),
320 NEXT J
330 PRINT
340 GOTO 50

```

Figure 6 — BASIC Program

RONALD REAGAN 2/ 6/1911 7 56 GMT 41 38 89 47
 GEO LONG LAT HELIO LONG LAT RT ASC DECL AZIMUTH ALT
 ① 16≈25 31 0 00 16Ω26 0 00 318 53 -15 55 41 40 -56 06
 ② 12Ⅱ21 21 - 0 10 39 58 15 23 144 42 -13 28
 ③ 1Ⅱ26 0 14 12Ⅱ48 0 33 293 07 -21 31 8 42 -42 37
 ④ 3Ⅱ33 - 1 30 27Ⅱ08 - 3 20 336 01 -11 37 73 35 -59 04
 ⑤ 3Ⅱ56 - 0 26 7Ⅱ36 - 0 36 274 18 -23 49 353 36 -29 57
 ⑥ 13Ⅱ44 1 14 3Ⅱ18 1 12 221 40 -14 48 326 23 12 52
 ⑦ 0Ⅱ49 - 2 22 6Ⅱ45 - 2 25 29 32 9 33 139 53 -24 17
 ⑧ 26Ⅱ30 - 0 30 25Ⅱ32 - 0 31 298 38 -21 21 13 19 -46 34
 ⑨ 19Ⅱ29 - 0 38 R 20Ⅱ20 - 0 37 110 59 21 24 187 12 40 58
 ⑩ 26Ⅱ07 - 6 42 R 27Ⅱ05 - 6 36 85 58 16 42 174 36 19 26
 ⑪ 14Ⅱ31

FIRE EARTH AIR WATER

CARD 0 3 0 1
 FIX 0 2 1 1
 MUT 0 0 1 1

A 28Ⅱ11 M 13Ⅱ14 VX 11Ⅱ55 EP 15Ⅱ47

1 28Ⅱ11 4 13Ⅱ14 7 28Ⅱ11 10 13Ⅱ14
 2 24Ⅱ28 5 8Ⅱ21 8 24Ⅱ28 11 8Ⅱ21
 ① 3Ⅱ56 ② 0Ⅱ49 ③ 26Ⅱ07 12 3Ⅱ20
 ④ 21Ⅱ26 6 3Ⅱ20 ⑤ 19Ⅱ29 ⑥ 13Ⅱ44
 ⑦ 26Ⅱ30 ⑧ 12Ⅱ21 9 26Ⅱ41
 3 26Ⅱ41 ⑨ 14Ⅱ31
 ⑩ 16≈26
 ⑪ 3Ⅱ33

①-② 2 10 ③-④ 43 46 A-M 74 57 ⑤-⑥ 113 05 ⑦-A 152 38
 ⑧-⑨ 5 04 ⑩-⑪ 50 12 ⑫-M 77 07 ⑬-⑭ 114 15 ⑮-⑯ 153 03
 ⑰-⑱ 11 32 ⑲-A 53 15 ⑳-A 78 15 ㉑-㉒ 116 53 ㉓-M 153 12
 ㉔-㉕ 13 42 ㉖-M 53 45 ㉗-① 78 40 ㉘-M 118 43 ㉙-② 154 41
 ㉚-A 14 27 ㉛-③ 55 18 ㉜-④ 85 55 ㉝-M 120 53 ㉞-A 164 10
 ㉟-⑤ 17 07 ㊱-⑥ 57 16 ㊲-⑦ 88 05 ㊳-M 128 12 ㊴-⑧ 164 27
 ㊵-⑨ 17 30 ㊶-A 58 19 ㊷-⑩ 92 42 ㊸-⑪ 128 25 ㊹-A 166 20
 ㊺-⑫ 19 56 ㊻-⑬ 59 37 ㊼-⑭ 94 19 ㊽-A 128 42 ㊾-⑮ 167 05
 ㊿-⑯ 22 34 ㊿-M 60 30 ㊿-A 95 22 ㊿-⑰ 129 41 ㊿-M 170 19
 ①-⑱ 23 22 ②-⑲ 64 58 ③-㉒ 99 23 ④-② 130 35 ⑤-③ 172 11
 ⑥-④ 25 00 ⑦-④ 67 08 ⑧-㉓ 105 51 ⑨-M 132 25 ⑩-④ 172 59
 ⑪-A 35 45 ⑫-④ 67 42 ⑬-② 108 01 ⑭-M 133 16 ⑮-④ 178 03
 ⑯-⑥ 37 03 ⑰-⑤ 68 48 ⑱-④ 109 49 ⑲-④ 135 56 ⑳-④ 178 37
 ㉑-② 41 36 ㉒-② 70 58 ㉓-M 110 42 ㉔-④ 137 37 ㉕-② 179 13
 ㉖-⑤ 42 07 ㉗-⑥ 72 46 ㉘-④ 110 55 ㉙-④ 149 37
 ㉚-⑤ 42 30 ㉛-⑦ 74 23 ㉜-④ 112 34 ㉝-A 152 04

①-②-④ 2 42 ③-④-⑤ 1 14 ⑥-⑦-⑧ 1 57 ⑨-⑩-⑪ 0 47 ⑫-⑬-M 1 17
 ⑭-⑮-⑯ 1 55 ⑰-⑱-⑲ 2 10 ⑳-㉑-㉒ 0 23 ㉓-㉔-M 0 30
 ㉕-㉖-㉗ 1 23 ㉘-㉙-M 0 53 ㉚-㉛-① 0 56 ㉜-㉝-② 0 23
 ㉞-㉟-㊱ 11 32 ㊲-㊳-㊴ 5 04 ㊵-㊶-㊷ 3 07 ㊸-㊹-A 1 41